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A STUDY OF MICROPULSATIONS AT
TRIVANDRUM, ANNAMALAINAGAR
AND AT ALIBAG DURING THE IGY,
IGC PERIOD

Chakrabarty (1946) in his study of micropulsations at Alibag for five years during the period 1937 to 1945, noticed (1) that there is no marked monthly or seasonal variation in their occurrence, (2) that the diurnal variation of the frequency of micropulsations has a sharp maximum round about the local midnight, (3) that there is a correlation between the frequency of micropulsations and the international character figure, (4) that the micropulsations cannot be considered as a local phenomenon and (5) that the magnetic activity will possibly attenuate rather than accentuate the total number of pulsations in a year.

In the present study the magnetograms taken at Annamalainagar (geomagnetically $1^{\circ} \cdot 8$ N, $149^{\circ} \cdot 4$ E), Trivandrum (geomagnetically $0^{\circ} \cdot 9$ S, $146^{\circ} \cdot 3$ E) during the period 1957-1959 along with those for Alibag for the same period have been made use of. In this study, distinct micropulsations of period 2-3 minutes which are flanked on either side by quiet period at least for one hour, are taken into account.

Generally the micropulsations are of period 2.5 minutes, amplitude 4γ and having 6 oscillations in a single pulsation. In a pulsation the period of the wave remains more or less constant during the interval it is recorded. Taking amplitude as a factor, the pulsations can be broadly divided in two categories. In the first category of pulsations, the amplitude increases gradually till it attains the maximum at somewhere in the middle of the wave and then it decreases and dies. In the second category, the amplitude too remains practically the same. The second category is more common than the first. The general trend is for the pulsations to occur isolated and at long intervals, though there have been cases of series of pulsations at very short intervals.

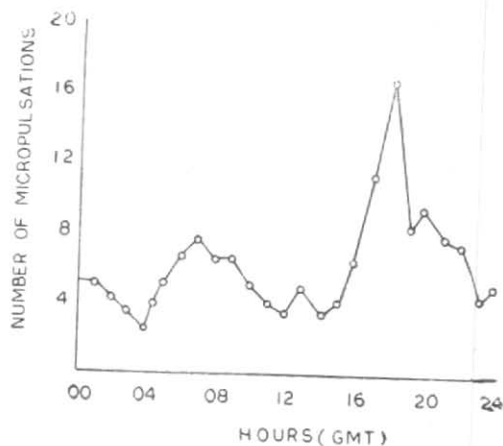


Fig. 1

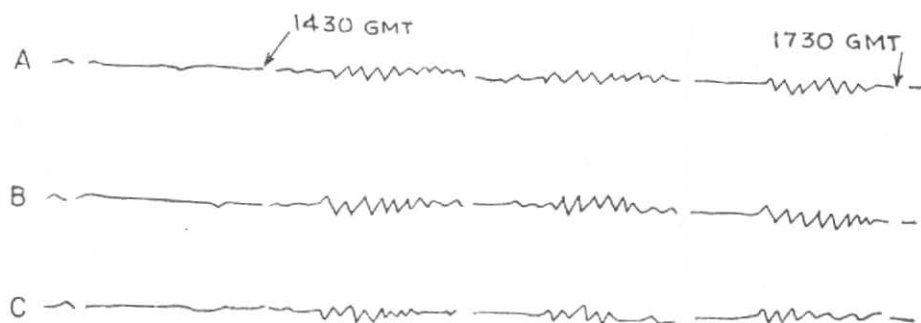


Fig. 2

It is seen from Table 1, that there is no marked change in the frequency of these pulsations from month to month. But the monthly values vary in a way similar to the variation of the monthly mean international character figure C. An increase in the value of the mean monthly value C from month to month is generally associated with a fall in the monthly value of the frequency of the pulsations and *vice versa*, though the degree of the variation is not always equivalent. This strengthens the belief that micro-

pulsations are equally frequent during period of magnetically disturbed days, but they are mixed up with the large variations of the magnetic elements and hence with the increase in disturbance their frequency decreases. When considered seasonwise, there is a slight increase in their frequency during the equinox.

The present study also corroborates the findings from different observatories that the frequency of these pulsations has a sharp

TABLE 1
Annual and seasonal variations of micropulsation frequency

Year	J	F	M	A	M	J	J	A	S	O	N	D	d—	e—	j—
													solstice	equinox	solstice
1957										10	8	9			
1958	18	8	7	11	21	20	10	6	29	14	16	13	55	61	57
1959	13	6	16	18	17	15	4	5	13	18	6	7	32	65	41

TABLE 2

Date	Time of start (GMT)	Duration (min.)	Maximum double amplitude in		
			Trivandrum	Annamalainagar	Alibag
27-3-1958	1752	15	4.9	4.0	3.0
12-12-1958	1848	12	4.1	3.5	3.9
16-3-1959	1745	27	3.5	3.4	2.6
8-12-1959	1633	45	6.7	7.0	4.4

maximum near about the local midnight and a minimum near about three hours before local noon. The mean diurnal variation curve of these micropulsations for 1958-1959 is shown in Fig. 1.

Unlike magnetic storms, the same micropulsations are not recorded everywhere. It is known that observatories even very close to each other often do not record the same micropulsation. As such it is interesting to find that all the micropulsations studied have been recorded simultaneously at all the three Indian observatories, as illustrated in Fig. 2.

Though the same micropulsations having the same period are recorded simultaneously on all the magnetograms of the stations considered, they are not identical type in all the three stations, and in all the elements. Taking pulsations in H.F. it is seen that the amplitude changes from station to station and from pulsation to pulsation. For the same pulsation

in V.F. while there is not much difference in the amplitudes at Trivandrum and Annamalainagar, they are about four times less at Alibag. In D for the same pulsation, the amplitude is greatest at Annamalainagar, less at Alibag, and least at Trivandrum. The above observations hold good for both day and night time pulsations. The amplitudes of a few pulsations as recorded in H.F. for all the three stations are given in Table 2.

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REFERENCE

- Chakrabarty, S. K. 1946 *India met. Dep. Sci. Note*, 10, 126.